

## Balancing Chemical Equations

Balance the following equations on a separate sheet of paper and; **use a pencil** Not a Pen  
... **do not give up**

1.  $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$
2.  $\text{S}_8 + \text{O}_2 \rightarrow \text{SO}_3$
3.  $\text{HgO} \rightarrow \text{Hg} + \text{O}_2$
4.  $\text{Zn} + \text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$
5.  $\text{Na} + \text{H}_2\text{O} \rightarrow \text{NaOH} + \text{H}_2$
6.  $\text{C}_{10}\text{H}_{16} + \text{Cl}_2 \rightarrow \text{C} + \text{HCl}$
7.  $\text{Si}_2\text{H}_3 + \text{O}_2 \rightarrow \text{SiO}_2 + \text{H}_2\text{O}$
8.  $\text{Fe} + \text{O}_2 \rightarrow \text{Fe}_2\text{O}_3$
9.  $\text{C}_7\text{H}_6\text{O}_2 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
10.  $\text{FeS}_2 + \text{O}_2 \rightarrow \text{Fe}_2\text{O}_3 + \text{SO}_2$
11.  $\text{Fe}_2\text{O}_3 + \text{H}_2 \rightarrow \text{Fe} + \text{H}_2\text{O}$
12.  $\text{K} + \text{Br}_2 \rightarrow \text{KBr}$
13.  $\text{C}_2\text{H}_2 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
14.  $\text{H}_2\text{O}_2 \rightarrow \text{H}_2\text{O} + \text{O}_2$
15.  $\text{C}_7\text{H}_{16} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
16.  $\text{SiO}_2 + \text{HF} \rightarrow \text{SiF}_4 + \text{H}_2\text{O}$
17.  $\text{KClO}_3 \rightarrow \text{KCl} + \text{O}_2$
18.  $\text{KClO}_3 \rightarrow \text{KClO}_4 + \text{KCl}$
19.  $\text{P}_4\text{O}_{10} + \text{H}_2\text{O} \rightarrow \text{H}_3\text{PO}_4$
20.  $\text{Sb} + \text{O}_2 \rightarrow \text{Sb}_4\text{O}_6$
21.  $\text{C}_3\text{H}_8 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
22.  $\text{Fe}_2\text{O}_3 + \text{CO} \rightarrow \text{Fe} + \text{CO}_2$
23.  $\text{PCl}_5 + \text{H}_2\text{O} \rightarrow \text{HCl} + \text{H}_3\text{PO}_4$
24.  $\text{H}_2\text{S} + \text{Cl}_2 \rightarrow \text{S}_8 + \text{HCl}$
25.  $\text{Fe} + \text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + \text{H}_2$
26.  $\text{N}_2 + \text{H}_2 \rightarrow \text{NH}_3$
27.  $\text{N}_2 + \text{O}_2 \rightarrow \text{N}_2\text{O}$
28.  $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2$
29.  $\text{SiCl}_4 + \text{H}_2\text{O} \rightarrow \text{H}_4\text{SiO}_4 + \text{HCl}$
30.  $\text{H}_3\text{PO}_4 \rightarrow \text{H}_4\text{P}_2\text{O}_7 + \text{H}_2\text{O}$
31.  $\text{CO}_2 + \text{NH}_3 \rightarrow \text{OC}(\text{NH}_2)_2 + \text{H}_2\text{O}$
32.  $\text{Al}(\text{OH})_3 + \text{H}_2\text{SO}_4 \rightarrow \text{Al}_2(\text{SO}_4)_3 + \text{H}_2\text{O}$
33.  $\text{Fe}_2(\text{SO}_4)_3 + \text{KOH} \rightarrow \text{K}_2\text{SO}_4 + \text{Fe}(\text{OH})_3$
34.  $\text{H}_2\text{SO}_4 + \text{HI} \rightarrow \text{H}_2\text{S} + \text{I}_2 + \text{H}_2\text{O}$
35.  $\text{Al} + \text{FeO} \rightarrow \text{Al}_2\text{O}_3 + \text{Fe}$
36.  $\text{Na}_2\text{CO}_3 + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$
37.  $\text{P}_4 + \text{O}_2 \rightarrow \text{P}_2\text{O}_5$
38.  $\text{K}_2\text{O} + \text{H}_2\text{O} \rightarrow \text{KOH}$
39.  $\text{Al} + \text{O}_2 \rightarrow \text{Al}_2\text{O}_3$
40.  $\text{Na}_2\text{O}_2 + \text{H}_2\text{O} \rightarrow \text{NaOH} + \text{O}_2$
41.  $\text{C} + \text{H}_2\text{O} \rightarrow \text{CO} + \text{H}_2$
42.  $\text{H}_3\text{AsO}_4 \rightarrow \text{As}_2\text{O}_5 + \text{H}_2\text{O}$
43.  $\text{Al}_2(\text{SO}_4)_3 + \text{Ca}(\text{OH})_2 \rightarrow \text{Al}(\text{OH})_3 + \text{CaSO}_4$
44.  $\text{FeCl}_3 + \text{NH}_4\text{OH} \rightarrow \text{Fe}(\text{OH})_3 + \text{NH}_4\text{Cl}$
45.  $\text{Ca}_3(\text{PO}_4)_2 + \text{SiO}_2 \rightarrow \text{P}_4\text{O}_{10} + \text{CaSiO}_3$
46.  $\text{N}_2\text{O}_5 + \text{H}_2\text{O} \rightarrow \text{HNO}_3$
47.  $\text{Al} + \text{HCl} \rightarrow \text{AlCl}_3 + \text{H}_2$
48.  $\text{H}_3\text{BO}_3 \rightarrow \text{H}_4\text{B}_6\text{O}_{11} + \text{H}_2\text{O}$
49.  $\text{Mg} + \text{N}_2 \rightarrow \text{Mg}_3\text{N}_2$
50.  $\text{NaOH} + \text{Cl}_2 \rightarrow \text{NaCl} + \text{NaClO} + \text{H}_2\text{O}$

51. Nitrogen plus hydrogen produces ammonia. (Remember diatomic elements!)
52. Sodium oxide combines with water to form sodium hydroxide.
53. Sodium sulfate reacts with calcium nitrate to produce sodium nitrate and calcium sulfate.
54. Zinc reacts with iron(III) chloride yielding zinc chloride plus iron.
55. Sodium reacts with magnesium chloride yielding sodium chloride plus magnesium.
56. Aluminum bromide plus chlorine yield aluminum chloride and bromine.
57. Aluminum nitrate and sodium sulfide react to form aluminum sulfide and sodium nitrate.
58. Sodium acetate and iron (III) chloride react to form sodium chloride and iron (III)acetate
59. Hydrogen and Sulfur combine to form dihydrogen monosulfide
60. Write out any tricks you have developed for balancing equations using the inspection method

1.  $2, 1 \rightarrow 2$
2.  $1, 12 \rightarrow 8$
3.  $2 \rightarrow 2, 1$
4.  $1, 2 \rightarrow 1, 1$
5.  $2, 2 \rightarrow 2, 1$
6.  $1, 8 \rightarrow 10, 16$
7.  $4, 11 \rightarrow 8, 6$
8.  $4, 3 \rightarrow 2$
9.  $2, 15 \rightarrow 14, 6$
10.  $4, 11 \rightarrow 2, 8$
11.  $1, 3 \rightarrow 2, 3$
12.  $2, 1 \rightarrow 2$
13.  $2, 5 \rightarrow 4, 2$
14.  $2 \rightarrow 2, 1$
15.  $1, 11 \rightarrow 7, 8$
16.  $1, 4 \rightarrow 1, 2$
17.  $2 \rightarrow 2, 3$
18.  $4 \rightarrow 3, 1$
19.  $1, 6 \rightarrow 4$
20.  $4, 3 \rightarrow 1$
21.  $1, 5 \rightarrow 3, 4$
22.  $1, 3 \rightarrow 2, 3$
23.  $1, 4 \rightarrow 5, 1$
24.  $8, 8 \rightarrow 1, 16$
25.  $3, 4 \rightarrow 1, 4$
26.  $1, 3 \rightarrow 2$
27.  $2, 1 \rightarrow 2$
28.  $6, 6 \rightarrow 1, 6$
29.  $1, 4 \rightarrow 1, 4$
30.  $2 \rightarrow 1, 1$
31.  $1, 2 \rightarrow 1, 1$
32.  $2, 3 \rightarrow 1, 6$
33.  $1, 6 \rightarrow 3, 2$
34.  $1, 8 \rightarrow 1, 4, 4$
35.  $2, 3 \rightarrow 1, 3$
36.  $1, 2 \rightarrow 2, 1, 1$
37.  $1, 5 \rightarrow 2$
38.  $1, 1 \rightarrow 2$
39.  $4, 3 \rightarrow 2$
40.  $2, 2 \rightarrow 4, 1$
41.  $1, 1 \rightarrow 1, 1$
42.  $2 \rightarrow 1, 3$
43.  $1, 3 \rightarrow 2, 3$
44.  $1, 3 \rightarrow 1, 3$
45.  $2, 6 \rightarrow 1, 6$
46.  $1, 1 \rightarrow 2$
47.  $2, 6 \rightarrow 2, 3$
48.  $6 \rightarrow 1, 7$
49.  $3, 1 \rightarrow 1$
50.  $2, 1 \rightarrow 1, 1, 1$

51.  $1\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$
52.  $1\text{Na}_2\text{O} + 1\text{H}_2\text{O} \rightarrow 2\text{NaOH}$
53.  $1\text{Na}_2\text{SO}_4 + 1\text{Ca}(\text{NO}_3)_2 \rightarrow 2\text{NaNO}_3 + 1\text{CaSO}_4$
54.  $3\text{Zn} + 2\text{FeCl}_3 \rightarrow 3\text{ZnCl}_2 + 2\text{Fe}$
55.  $2\text{Na} + 1\text{MgCl}_2 \rightarrow 2\text{NaCl} + 1\text{Mg}$
56.  $2\text{AlBr}_3 + 3\text{Cl}_2 \rightarrow 2\text{AlCl}_3 + 3\text{Br}_2$
57.  $1\text{Al}(\text{NO}_3)_3 + 3\text{Na}_2\text{S} \rightarrow 2\text{AlS}_3 + 3\text{NaNO}_3$
58.  $3\text{NaC}_2\text{H}_3\text{O}_2 + \text{FeCl}_3 \rightarrow 3\text{NaCl} + 1\text{Fe}(\text{C}_2\text{H}_3\text{O}_2)_3$
59.  $1\text{H}_2 + 1\text{S} \rightarrow 1\text{H}_2\text{S}$